

# Predicting reactions

## Task 1: The reactivity series

Symbol	Name	Reacts with oxygen?	Reacts with water?	Reacts with dilute acid?
K	potassium	✓	✓, fast in cold	✓
Na	sodium	✓	✓, fast in cold	✓
Ca	calcium	✓	✓, fast in cold	✓
Mg	magnesium	✓	✓, slow in cold, fast in steam	✓
Al	aluminium	✓	✓, needs steam	✓
Zn	zinc	✓	✓, fast in steam	✓
Fe	iron	✓	✓, fast in steam	✓
Pb	lead	✓	no	✓
Cu	copper	✓	no	no
Au	gold	no	no	no

From the reactivity series, name:

- 1 A metal that does not react with oxygen. ....
- 2 A metal with a fast reaction in cold water. ....
- 3 Three metals that do not react with water. ....
- 4 A metal that reacts slowly in cold water. ....
- 5 Two metals that do not react with dilute acids. ....
- 6 A metal that reacts with oxygen, but not with dilute acid. ....
- 7 A metal that reacts with oxygen and dilute acid, but not with water. ....
- 8 The most unreactive metal. ....

## Task 2: Predicting reactions



Use the above section of the reactivity series to predict which of the following reactions will take place.

- 1 Magnesium sulfate + copper → .....
- 2 Zinc + tin oxide → .....
- 3 Zinc oxide + calcium → .....
- 4 Magnesium sulfate + iron → .....
- 5 Zinc + magnesium oxide → .....
- 6 Iron sulfate + magnesium → .....
- 7 Copper + iron oxide → .....
- 8 Magnesium sulfate + zinc → .....
- 9 Zinc oxide + tin → .....
- 10 Magnesium + calcium oxide → .....

### Task 3: Writing sulfate formulae

The sulfate group has the formula  $\text{SO}_4$ . It makes two bonds with the rest of the formula.

Copper, Cu, makes two bonds, so the formula of copper sulfate is  $\text{CuSO}_4$ .

Sodium, Na, makes one bond, so the formula for sodium sulfate is  $\text{Na}_2\text{SO}_4$ . We need two sodium atoms to make up two bonds.

Write the formulae for these sulfates:

- 1 Magnesium sulfate. Magnesium makes two bonds.

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- 2 Zinc sulfate. Zinc makes two bonds.

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- 3 Iron sulfate. Iron makes two bonds.

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- 4 Potassium sulfate. Potassium makes one bond.

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- 5 Silver sulfate. Silver makes one bond.

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